



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/851,069	05/08/2001	Xiaoyuan Cui	1919	2854

7590

09/01/2005

Laurelee A. Duncan  
National Starch & Chemical Company  
10 Finderne Avenue  
Bridgewater, NJ 08807-0500

EXAMINER

HUG, ERIC J

ART UNIT

PAPER NUMBER

1731

DATE MAILED: 09/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/851,069	<b>Applicant(s)</b> CUI ET AL.	
	<b>Examiner</b> Eric Hug	<b>Art Unit</b> 1731	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 30 June 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-11, 14 and 15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11, 14 and 15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |                                                                                                                        |                                                                                         |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                            | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____                                                |

*Handwritten mark*

***Response to Amendment***

The following is in response to the amendment filed on June 30, 2005.

***Claim Rejections - 35 USC § 102***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

1. Claims 1-11 and 15-16 are rejected under 35 U.S.C. 102(b) as being anticipated by Viikari et al (WO 99/23117).

Viikari teaches oxidation of carbohydrates including cellulose to provide carboxylic and carbonyl groups (includes aldehydes) using a TEMPO nitroxyl mediator, hydrogen peroxide, and an enzyme. The enzyme can be a peroxidase (page 3, lines 13-21). A bromide catalyst is used (page 3, lines 9-11). Reaction conditions are given on page 4 and illustrated by the given Examples. These all read on the claimed features.

2. Claims 1-11 and 15-16 are rejected under 35 U.S.C. 102(e) as being anticipated by Jaschinski et al (US 6,824,645).

Jaschinski teaches oxidation of cellulose to provide aldehyde groups using TEMPO nitroxyl mediator, hydrogen peroxide, and an peroxidase enzyme in the presence of a halide. Reaction conditions (pH, addition rates, temperatures) all read on the claimed conditions.

***Claim Rejections - 35 USC § 103***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 1-11, 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Amann et al (US 6,242,245) in view of Allen (US 6,503,507) or Johansen (US 6,251,386).

Amann teaches oxidizing a carbohydrate (cellulose pulp) with a nitroxyl radical mediator (column 21, lines 62-64 and column 23, line 10-column 24, line 46), a chloride peroxidase (column 5, line 2) and hydrogen peroxide (column 5, lines 45-51). The claimed nitroxyl radical mediators of Amann et al do not differ from the mediators of the instant case and/or would have been obvious variants of the nitroxyl radical mediators of Amann et al. The claimed conditions are the same and/or obvious over the conditions used in the Examples of Amann et al.

Amman does not expressly disclose the presence of a halide. However, the chloride peroxidase, by the very essence of its name, must be in the presence of a chloride or other halide. As taught by Allen (cited in previous office actions) a haloperoxidase in the presence of halides and hydrogen peroxide is an effective oxidant. This is also taught by Johansen. A chloride peroxidase is an enzyme capable of oxidizing chloride, bromide, or iodide ions with the consumption of hydrogen peroxide. Accordingly, other haloperoxidases behave in a similar manner. Haloperoxidases oxidize halides (X=Cl-, Br-, or I) in the presence of hydrogen peroxide to the corresponding hypohalous acid (HOX). Therefore, at the time of the invention, it would have been obvious to one skilled in the art that Amann include a halide (e.g., chloride) with chloride peroxidase for it to be effective in oxidizing cellulose.

Art Unit: 1731

Note that Johansen also teaches that vanadium haloperoxidases are preferred. See particularly column 3 of Johansen.

*Response to Arguments*

Applicant's arguments filed June 30, 2005 have been fully considered.

In response to the arguments, the previous rejection of Amman in view of Allen has been rewritten above to further include the teachings of Johansen in order to emphasize the obviousness of including a halide with chloride peroxidase.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric Hug whose telephone number is 571 272-1192. The examiner can normally be reached on Monday through Friday, 10:00 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on 571 272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

